



PATENT  
CR01-011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Dean et al. Group Art Unit: 2879  
Application No.: 09/942451 Examiner: S.Leurig  
Date Filed: 29 August 2001  
Title: FIELD EMISSION DISPLAY AND METHODS OF FORMING A FIELD EMISSION DISPLAY

CERTIFICATE OF MAILING

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:  
ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231, ON: *December 9, 2003*

Date of Deposit

MOTOROLA INC.

Name of Assignee

*[Signature]*  
SIGNATURE

*12-9-03 SN*  
DATE

INFORMATION DISCLOSURE STATEMENT (IDS)

Assistant Commissioner For Patents  
Washington, D.C. 20231

SIR:

In accordance with 37 C.F.R. §1.56 and in compliance with 37 C.F.R. §§1.97 and 1.98, the references listed on attached Form PTO/SB/08 and/or subsequently identified herein, are being submitted herewith for consideration by the United States Patent and Trademark Office.

I. COPIES

- a.  A legible copy of (i) each U.S. and foreign patents; (ii) each publication or that portion which caused it to be listed; and (iii) all other information or that portion which caused it to be listed, is included herewith.  
b.  Any patents, publications or other information which are listed on PTO/SB/08 which are not enclosed herewith were previously cited by or submitted to the PTO in one of the following applications which has been relied upon for an earlier filing date under 35 U.S.C. §120:

U.S. Serial Number

U.S. Filing Date

II. CONCISE EXPLANATION OF THE RELEVANCE (check at least one box)

- a.  Except as may be indicated below in (b) of this section, all of the patents, publications or other information are in the English language (concise explanation not required).  
b.  A concise explanation of the relevance of all patents, publications or other information listed that is not in the English language is as follows:  
c.  The following additional information is provided for the Examiner's consideration:

III.  CROSS REFERENCE TO RELATED APPLICATION(S)

The Examiner is advised that the following co-pending application(s) contain(s) subject matter that may be related to the present application. By bringing this (these) applications to the Examiner's attention, Applicant(s) does(do) not waive the confidentiality provisions of 35 U.S.C. §122.

Serial No.

Filing Date

Art Unit

12/16/2003 JBALINAN 00000111 502117 09942451

02 FC:1806

180.00 DA

**FEES**

- IV.  **THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(b):** (check one box)
- a. within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d) (37 C.F.R. §1.97(b)(1)). No fee or statement is required.
- b. within three months of the date of entry of the national stage as set forth in § 1.491 in an international application (37 C.F.R. §1.97(b)(2)). No fee or statement is required.
- c. before the mailing date of a first Office Action on the merits (37 C.F.R. §1.97(b)(3)). No fee or statement is required.
- d. before the mailing date of a first Office Action after the filing of a request for continued examination under § 1.114 (37 C.F.R. § 1.97(b)(4)). No fee or statement is required.
- V.  **THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(c):** (check one box)
- before the mailing date of any of a Final Office Action under 37 C.F.R. §1.113, a Notice of Allowance under 37 C.F.R. §1.311, or an action that otherwise closes prosecution in the application (See 37 C.F.R. §1.97(c)).
- a.  No statement; therefore, charge deposit account 502117 the fee set forth in 37 C.F.R. §1.17(p).
- b.  See the statement below. No fee is required.
- VI.  **THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(d):**  
on or before payment of the issue fee and is accompanied by the following:
- 1) a statement under 37 C.F.R. §1.97(e) as provided below; and
- 2) charge deposit account 502117 the petition fee set forth in §1.17(p).
- VII.  **STATEMENT UNDER 37 C.F.R. §1.97(e) (check only one box, if applicable)**  
The undersigned hereby states that
- a. each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of IDS; or
- b. no item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application, and to knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement, or
- c. some of the items of information contained in the IDS were cited in a communication from a foreign Patent Office. As to this information, the undersigned states that each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby states that no item of this remaining information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application or, to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement.
- VIII. **PAYMENT OF FEES**
- A check in the amount of \_\_\_\_\_ is enclosed for the above-identified fee(s).
- Please charge Deposit Account No. 502117 in the amount of \$180.00 for the above-indicated fee(s).
- If Applicant has overlooked any additional fees, or if any overpayment has been made, the Commissioner is hereby authorized to credit or debit Deposit Account 502117.
- Two Copies of this paper are attached for Deposit Account charges and debits.

The above references are being cited only in the interests of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art.

PATENT  
CR01-011

If the Examiner has any questions concerning this IDS, he/she is requested to contact the undersigned. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule (with a petition if necessary) and charge the appropriate fee to Deposit Account No. 502117

Respectfully submitted,  
Dean et al.



William E. Koch  
Attorney for Applicant(s)  
Reg. No. 29,659  
Tel. 602-952-3486

MOTOROLA, INC.  
Customer Number 23330

Enclosures:

- PTO/SB/08
- References
- Foreign Search Report
- Other:



Type a plus sign (+) inside this box.

PATENT  
CR01-011

Substitute for form 1449A/PTO				<u><i>Complete if Known</i></u>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<b>Application Number</b>	09/942451
				<b>Filing Date</b>	August 29, 2001
				<b>First Named Inventor</b>	Dean et al.
				Group Art Unit	
				Examiner Name	
(use as many sheets as necessary)				Attorney Docket Number	CR01-011
Sheet	1	of	4		

## **U. S. PATENT DOCUMENTS**

## **FOREIGN PATENT DOCUMENTS**

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

**EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation, if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> See *Kinds of U.S. Patent Documents*. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English Language Translation is attached.



PATENT  
CR01-011

[+]

Substitute for form 1449A/PTO				<i>Complete if Known</i>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>				<b>Application Number</b>	09/942451
				<b>Filing Date</b>	August 29, 2001
				<b>First Named Inventor</b>	Dean et al.
				<b>Group Art Unit</b>	
				<b>Examiner Name</b>	
Sheet	2	Of	4	Attorney Docket Number	CR01-011

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			
	4	Xu et al., "A method for fabricating large-area, patterned, carbon nanotube field emitters," Applied Physics Letters, Vol. 74, No. 17, 26 April 1999, pp. 2549-2551.			
	5	Fan et al., "Self-oriented regular arrays of carbon nanotubes and their field emission properties," Science, Vol. 283, 22 January 1999, pp. 512-514.			
	6	Suh et al., "Highly ordered two-dimensional carbon nanotube arrays," Applied Physics Letters, Vol. 75, No. 14, 4 October 1999, pp. 2047-2049.			
	7	Hernadi et al. "Catalytic synthesis of carbon nanotubes using zeolite support," Zeolites 17, 1996, pp. 416-423.			
	8	Murakami et al., "Field emission from well-aligned, patterned, carbon nanotube emitters," Applied Physics Letters, Vol. 76, No. 13, 27 March 2000, pp. 1776-1778.			
	9	Ma et al., "Polymerized carbon nanobells and their field-emission properties," Applied Physics Letters, Vol. 75, No. 20, 15 November 1999, pp. 3105-3107.			
	10	Li et al, "Highly-ordered carbon nanotube arrays for electronics applications," Applied Physics Letters, Vol. 75, No. 3, 19 July 1999, pp. 367-369.			
	11	Terrones et al., "Controlled production of aligned-nanotube bundles," Nature, Vol. 388, 3 July 1997, pp.52-55.			
	12	Xu et al., "Controlling growth and field emission property of aligned carbon nanotubes on porous silicon substrates," Applied Physics Letters, Vol. 75, No. 4, 26 July 1999, pp. 481-483.			
	13	Tsai et al., "Bias-enhanced nucleation and growth of the aligned carbon nanotubes with open ends under microwave plasma synthesis," Applied Physics Letters, Vol. 24, No. 23, 7 June 1999, pp. 3462-3464.			
	14	Kind et al., "Patterned films of nanotubes using microcontact printing of catalysts," Advanced Materials, 11, No. 15, 1999, pp. 1285-1289.			

Examiner Signature		Date Considered
--------------------	--	-----------------



PATENT  
CR01-011

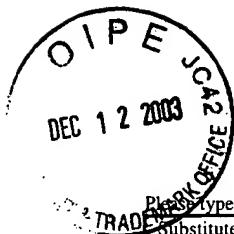
Please type or print a plus sign (+) inside this box.

Substitute for form 1449A/PTO				<i>Complete if Known</i>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>				Application Number	09/942451
Sheet	3	Of	4	Filing Date	August 29, 2001
				First Named Inventor	Dean et al.
				Group Art Unit	
				Examiner Name	
				Attorney Docket Number	CR01-011

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T <sub>2</sub>
	15	Nilsson et al., "Scanning field emission from patterned carbon nanotube films." Applied Physics Letters, Vol. 76, No. 15, 10 April 2000, pp. 2071-2073.		
	16	Kuttel et al, "Electron field emission from phase pure nanotube films grown in a methane/hydrogen plasma," Applied Physics Letters, Vol. 73, No. 15, 12 October 1998, pp. 2113-2115.		
	17	Ren et al., "Synthesis of large arrays of well-aligned carbon nanotubes on glass," Science, Vol. 282 6 November 1998, pp. 1105-1107.		
	18	Ren et al. "Growth of a single freestanding multiwall carbon nanotube on each nanonickel dot," Applied Physics Letters, Vol 75, No. 8 23 August 1999, pp. 1086-1088.		
	19	Pan et al., "Very long carbon nanotubes," Nature, Vol. 394, 13 August 1998, pp. 631-632.		
	20	Zhang et al., "A flat panel display device fabricated by using carbon nanotubes cathode," IEEE, 2001, pp. 193-194.		
	21	Zhong et al., "Large-scale well aligned carbon nitride nanotube films: Low temperature growth and electron field emission," Journal of Applied Physics, Vol. 89, No. 11, 1 June 2001, pp. 5939-5943.		
	22	Kim et al., "Growth and field emission of carbon nanotubes on electroplated Ni catalyst coated on glass substrates," Journal of Applied Physics, Vol. 90, 1 September 2001, pp.2591-2594.		
	23	Gulyaev et al., "Field emitter arrays on nanotube carbon structure films," J. Vac.Sci. Technol. B 13(2), Mar/Apr 1995, pp. 435-436.		
	24	Chernozatonskii, et al. "Nanotube carbon structure tips – a source of high field emission of electrons," Mat. Res.Soc. Symp. Proc., Vol. 359. 1995 Materials Research Society, pp. 99-104.		
	25	Su et al., "A scalable CVD method for the synthesis of single-walled carbon nanotubes with high catalyst productivity," Chemical Physics Letters 322, (2000), pp 321-326.		

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation, if not in conformance and not considered. Include copy of this form with next communication to applicant.



PATENT  
CR01-011

Please type a plus sign (+) inside this box.

TRADE Substitute for form 1449A/PTO

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	09/942451
				Filing Date	August 29, 2001
				First Named Inventor	Dean et al.
				Group Art Unit	
				Examiner Name	
Sheet	4	Of	4	Attorney Docket Number	CR01-011

<b>OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS</b>		
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	26	Li et al. "Large-scale synthesis of aligned carbon nanotubes," Science, Vol. 274, 6 December 1996, pp. 1701-1703
	27	Cassell et al. "Large scale CVD synthesis of single-walled carbon nanotubes," J. Phys. Chem. B. 1999, 103, pp. 6484-6492.
	28	Cassell et al. "Directed growth of free-standing single walled carbon nanotubes," J. Am. Chem. Soc. 1999, 121, pp. 7975-7976.
	29	Cassell et al, "Combinatorial optimization of heterogeneous catalysts used in the growth of carbon nanotubes," Langmuir 2001, 17, pp. 260-264.
	30	Li et al, "Large-scale synthesis of aligned carbon nanotubes," Science, Vol. 274, 6 December 1996, pp. 1701-1703.

Examiner Signature	Date Considered
--------------------	-----------------

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation, if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English Language Translation is attached.